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FABRICATION STUDY ON THE EFFECT OF DOUBLE SPROCKET MECHANISM IN BICYCLE

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ABSTRACT

The current work introduces a model for fast moving vehicle that approaches to design a cost effective, safe and durable product. This concept would be an innovative product in the market for recreational vehicles in designing a vehicle of increased speed, when compared to the conventional vehicle. Our project has fabricated the conventional vehicle by a special designed sprocket system consisting of the triple chain series, which helps the vehicle to run at high speed in minimum time period.

KEYWORDS*: *Fabrication, Double Sprocket Chain Mechanism & Power Output

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Original Article

INTRODUCTION

In the era of mechanical world, you have to deal with new technology and ideas. So, the first thing to develop a prototype is design, which should be stable and convenient to the surroundings. We have to analyze different materials for the best result that can help to bear the forces [1-2]. Human started thinking on reaching farther distance in less time. This is the new method implanted to achieve appreciable increase in speed range without the use of any type of fuels [3]. Technological innovation in the transport sector suggested that, a vehicle is to be eco-friendly for the use of future generations [4]. Earlier, a vehicle having three drive chains with pedaling output included a left front sprocket and a right front sprocket was designed [5] So an effort, to overcome these problems by introducing a new concept to generate the power efficiently by avoiding conventional sources and even cut-off pollution totally [6]. The aim of this project is to introduce a model vehicle consisting of a dual chain with special sprocket system.

EXPERIMENTATION

A special type of sprocket system is designed to make the vehicle move easily with less amount of power usage than the conventional vehicle. The main purpose of this proposed project is to provide a fast moving vehicle while solving the fuel scarcity. There are four major sprockets, which are used in the power transfer while running manually. First sprocket used has a diameter of 7cm, second and fourth has 2.5cm while the third one has a diameter of 5cm. Among these four major sprockets, the midst of the two sprockets is mounted on the same shaft. A secondary sprocket makes connection between rotor and the 4 major sprockets. A special frame or body is designed for this kind of chain system. Using this sprocket chain mechanism, speed is doubled when compared to the conventional vehicle.

Figure 1: Represents Double Sprocket Chain Drive System

The simple mechanism to run a vehicle faster is shown in the above Figure 1 In this, the driving sprocket is the pedaling sprocket that moves the second sprocket which is driven, and the driven sprocket is attached to the third sprocket on a single shaft that is able to move the free wheel smoothly, which is attached to a rear wheel of the bicycle

RESULTS

Table 1: Representing the Velocity and Power Output at Different Sprockets

	Sprocket - 1	Sprocket - 2	Sprocket - 3	Sprocket - 4
Velocity (m/s)	3.67	3.14	6.37	5.63
Power (W)	16.2	10.26	27.02	18.39

The proposed model of a chain drive consists of three chain system, which helps to increase the speed of the vehicle. In this system, the shafts vary in the distance when compared to the conventional model.

Comparison between Conventional and Proposed Chain Drive

- Speed obtained at the end sprocket, when 10 rpm is introduced initially for **conventional chain drive** is **24.4 rpm,** whereas for the **proposed chain drive** observes a speed of **43.4 rpm** at the end sprocket.
- Power attained at the end sprocket of **conventional chain drive** is **10.26 W** and for the **proposed chain drive** is **18.39 W.**

Hence, the proposed model is advantageous over conventional vehicle of chain mechanism use.

CONCLUSIONS

The goal of the project is to design and fabricate double sprocket operating. We have successfully completed a project, where we designed and built a prototype. This mainly involved machining and assembling the parts of the vehicle that developed as a more fuel-efficient means of transportation. The introduced model attains double the speed compared to the conventional model. A vehicle which bolsters environment, free from pollution, at the same time providing speed of high range is proposed to beneficial to the people and at the same time supplying vehicles economically to even common man.

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